

In the Description

On page 1, after the title of the invention, please add the following section heading and accompanying paragraph:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a U.S. national counterpart application of international application serial no. PCT/EP2005/001196 filed February 5, 2005, which claims priority to German application serial no. 10 2004 010 529.4 filed March 4, 2004.

Please add the following heading before the paragraph on page 1, lines 10-14:

FIELD OF THE INVENTION:

Please replace the paragraph on page 1, lines 10-14 with the following amended paragraph:

The present invention relates generally to a handheld analysis device for analyzing a sample, in particular a biological liquid, for a medically significant component, and more specifically to such a handheld analysis device comprising an analysis sensor to which an analytic consumable may be supplied along a conveyance path, a display unit, and a housing, which has a housing opening for an analytic consumable, the conveyance path leading to the housing opening,

Please add the following heading before the paragraph on page 1, lines 16-20:

BACKGROUND

Please replace the paragraph on page 2, lines 9-13 with the following amended paragraph:

Handheld analysis devices for analyzing a medically significant component of a sample, such as devices for blood glucose monitoring, are typically used multiple times a day and carried continuously by a user. Therefore, ~~there is a need it is desirable~~ to provide ~~such small~~ handheld analysis devices ~~as small as possible and that are simultaneously make them as easy to handle as possible.~~

Please delete the paragraph on page 2, lines 15-18.

Please add the following heading before the paragraph on page 2, lines 20-24:

SUMMARY

Please add the following new paragraph before the paragraph on page 2, lines 20-24, but after the above heading:

The present invention may comprise one or more of the features recited in the attached claims, and/or one or more of the following features and combinations thereof.

Please replace the paragraph on page 2, lines 20-24 with the following amended paragraph:

In a handheld analysis device according to the present ~~invention disclosure~~ an analytic consumable, to which a drop of blood or urine was applied, for example, may be supplied by ~~means of the a~~ conveyance roll to the analysis sensor in the interior of the device ~~much more easily with the required positioning precision than is the case in handheld analysis devices according to the prior art.~~

Please replace the paragraph on page 3, lines 7-25 with the following amended paragraph:

In a handheld analysis device according to the present invention disclosure, the user only has to insert one end of the consumable lightly into the housing opening. The conveyance roll then grips the consumable. The transport of the consumable and its correct positioning with respect to the analysis sensor is performed automatically. A final position of the consumable may be detected mechanically, electrochemically, or optically using, for example, a position switch, which then turns off the drive of the conveyance roll. The ~~measure according to the present invention also has the advantage that the removal facility may be implemented compactly.~~ Hence, a handheld analysis device may be made smaller than in the prior art, especially, particularly if a drum magazine is used. Known handheld analysis devices having a removal facility for a drum magazine according to EP 1 022 565 A2 require a pushrod of significant length implemented as a plunger, which is inserted for removal of a consumable into an insertion opening of a chamber of the drum magazine. The insertion opening is diametrically opposite of a removal opening. Thus a consumable contained in the chamber is pushed out of the chamber and a housing opening of the device. For a pushrod to fulfill this purpose, it must have a length which at least corresponds to the length of the path on which a consumable is transported upon removal. ~~In order to house this pushrod, such a handheld analysis device according to the prior art must therefore have a significant length, which is at least the sum of the lengths of the pushrod and the drum magazine.~~

Please replace the paragraph on from page 3, line 27- page 4, line 5 with the following amended paragraph:

~~An advantage of the present invention is that the pushrod and therefore also the housing of [[a]] the handheld analysis device disclosed herein may be significantly shortened constructed compactly.~~ In a handheld analysis device according to the present invention disclosure it is already sufficient if a consumable can be pushed by a pushrod ~~so just~~ far out of the chamber that it may be gripped by the conveyance roll and moved in the removal direction. The conveyance roll is preferably situated directly adjacent to the removal opening of the inserted drum magazine, so that it is sufficient if the consumable is pushed approximately 0.5 to 1 cm out of its chamber by the pushrod. For this purpose, a pushrod having a length of 1 to 2 cm is ~~already sufficient, so that a handheld analysis device according to the present invention may be approximately 10 cm shorter than a device according to the prior art.~~

Please replace the paragraph on page 4, lines 7-17 with the following amended paragraph:

Using the conveyance roll, a consumable may advantageously be pushed without difficulty far enough out of a housing opening of the housing so that a sample, such as a drop of blood, may be applied to the consumable without a risk of contamination of the handheld analysis device by the sample. A handheld analysis device according to the present invention may be used much more comfortably and may be handled more easily due to this alleviation of the application of a sample to an analytic consumable. In known handheld analysis devices a longer pushrod is required the further the consumable is to be pushed out of the housing opening of the handheld analysis device. Hence, in known handheld analysis devices, easier handling during application of a sample to a consumable is always connected with the disadvantage of larger dimensions of the handheld analysis device.

Please add the following heading before the paragraph on page 4, lines 19-23:

BRIEF DESCRIPTION OF THE DRAWINGS

Please add the following heading before the paragraph on page 5, lines 5-15:

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

Please add the following new paragraph before the paragraph on page 5, lines 5-15, but after the above header:

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to a number of illustrative embodiments shown in the attached drawings and specific language will be used to describe the same.

Please replace the paragraph on page 6, lines 9-19 with the following amended paragraph:

The drum magazine 6 may be rotated step-by-step by the electric motor 8, so that one after another each of the removal openings 12 can be aligned with the housing opening 10 of the housing 4 and then a consumable 9 pushed out of the chamber 11, which is currently positioned for removal, by the plunger 14 of the removal facility 29. ~~A special feature of the embodiment shown is that~~ ~~The removal facility 29 comprises a drivable conveyance roll 16, shown in Figure 2, in addition to the plunger 14. The conveyance roll 16 may grip a consumable 9 protruding out of the drum magazine 6 and move it entirely or partially out of the drum magazine in the removal direction. The conveyance roll 16 therefore allows the plunger 14 to be~~ ~~much relatively short[[er]] than in devices known in the prior art,~~ since it is sufficient if the consumable 9 may be pushed a small amount out of the chamber 11 by the plunger 14.

Please replace the paragraph on page 6, lines 21-30 with the following amended paragraph:

The conveyance roll 16 is ~~preferably illustratively~~ situated directly adjacent to the removal opening 12 of the inserted drum magazine 6. In this way a consumable 9 has to protrude only ~~as little as possible~~ ~~slightly~~ out of its chamber 11 to be able to be gripped by the conveyance roll 16. In this way only a small minimum distance of approximately 1 mm is required between the front face of the inserted drum magazine 6 and the conveyance roll 16, so that the conveyance roll 16 and the inserted drum magazine 6 may rotate undisturbed. As a further measure for gripping a consumable 9 ~~as close as possible~~ ~~closely~~ to the removal opening 12 by the conveyance roll 16 and thus for making the plunger 14 ~~as relatively short as possible~~, the conveyance roll 16 ~~preferably illustratively~~ has a small diameter of approximately 3 to 10 mm, ~~especially preferably of and in some embodiments~~ 4 to 7 mm.

Please replace the paragraph on page 7, lines 1-11 with the following amended paragraph:

The conveyance roll 16 and a conveyance surface, which is stationary in relation thereto, form together a conveyance gap, through which the consumable 9 is moved in the conveyance direction. Alternatively, the conveyance roll 16 may - as shown in Figures 3 to 7 - form a conveyance gap together with a counter roll 31 situated diametrically opposite thereto. The conveyance gap ~~preferably~~ illustratively has a profile tailored to the consumable 9, in the form of a groove in the conveyance surface or the counter roll, for example, so that a test field of the consumable 9 is not squeezed and thus impaired during removal. ~~In this embodiment shown in Figure 2, in which the conveyance roll 16 works together with a stationary conveyance surface, offers the advantage that the removal facility 29 requires fewer movable parts and thus may be manufactured especially cost-effectively and is less susceptible to breakdown.~~

Please replace the paragraph on page 8, lines 1-10 with the following amended paragraph:

The conveyance base 17 is provided with a groove 19 running in the conveyance direction. This ~~advantageously~~ minimizes friction between the consumable 9 and the conveyance base 17. While the conveyance base 17 is manufactured from a material which is ~~as smooth as possible, having and has~~ a low coefficient of friction, such as polycarbonate, the conveyance rolls 16, 18 ~~preferably~~ illustratively have a surface ~~implemented~~ configured to ~~increase friction, having the largest possible~~ have a high coefficient of friction. For example, the rolls may have a roughened surface, may be made of hard or soft rubber, or may be coated with a rubber-like plastic to increase the friction. If the consumable 9 has a thickness varying over its length, the conveyance roll may be spring-loaded to adapt to differences in thickness.

Please replace the paragraph on page 8, line 19 – page 9, line 2 with the following amended paragraph:

In order to be able to transmit movement generated by the joint drive 30 of the removal facility 29 both to the plunger 14 and the conveyance rolls 16, 18, the removal facility 29 comprises a threaded rod 20 having a thread 21. The rod 20 extends laterally along the inserted drum magazine 6 and projects on both sides beyond its front faces. In the embodiment

shown in Figure 2, the removal facility 29 has a transmission 22, via which an electric motor belonging to the drive 30 may move the plunger 14. The threaded rod 20 comprises a gearwheel 23 which works together with the transmission 22, so that the threaded rod 20 may be set into rotation via the transmission 22 and the gearwheel 23. The gearwheel 23 may be a separate component which is attached to the threaded rod 20, or may be integrated in the threaded rod 20, by providing a section of the threaded rod 20 with teeth, for example. In ~~order to be able to provide the threaded rod 20 as short as possible~~ the illustrated embodiment, the gearwheel 23 is preferably illustratively situated on or near an end of the threaded rod 20 and the thread 21 is preferably situated on or near the other end.

Please replace the paragraph on page 9, line 28 – page 10, line 7 with the following amended paragraph:

If the conveyance rolls 16, 18 are rotatable around their geometrical longitudinal axes both clockwise and also counterclockwise, so that the consumable 9 may be moved both in the removal direction and also in the opposite direction, it is ~~advantageously~~ possible to reinsert a used consumable 9 into its chamber 11 of the drum magazine 6 after analysis is completed. In order to facilitate returning of a used consumable 9 to the magazine, the plunger 14 is equipped with a gripper element which may operationally engage a consumable 9 and allows a consumable 9 to be pulled by the plunger 14 as well. For example, the gripper element may comprise[[s]] an electromagnet which attracts an iron part of the consumable, or a mechanical hook which turns over at a predefined tensile force, as is exerted by the conveyance rolls 16, and releases the consumable 9.

Please replace the paragraph on page 10, lines 9-11 with the following amended paragraph:

In this way all consumables 9 contained in a drum magazine 6 may ~~advantageously~~ be disposed of together and a user no longer needs to dispose of a used consumable 9 individually after each analysis.

Please replace the paragraph on page 10, line 25 – page 11, line 5 with the following amended paragraph:

In the embodiment shown in Figures 3 through 7, the consumables 9 are test strips which have a test field 32 for receiving a sample. To prevent impairment of the test field 32 during removal of the consumable 9 from the drum magazine 6 and to prevent contamination of the removal facility 29, particularly the conveyance roll 16 and the counter roll 31, by the consumable 9, the consumable 9 passes through the conveyance gap in such a manner that the test field 32 of the consumable 9 extends transversely to the geometric axis of rotation of the conveyance roll 16 in the embodiment shown. In this way, the danger of impairing the test field 32 of the consumable 9 is reduced ~~even further than may be achieved in the embodiment, which was described on the basis of Figure 2~~, by a conveyance gap 33 having a profile, which is tailored to the consumable 9 and has the form of a groove 19 in the conveyance base 17 providing the conveyance surface, for example.

Please replace the paragraph on page 12, lines 22-30 with the following amended paragraph:

~~An important advantage of the handheld analysis device 1 described is that~~ The consumable 9 may protrude far enough out of the housing opening 10 in the sample application position shown in Figure 14 that a sample may be applied easily to the sample application surface 34 without thereby contaminating the handheld analysis device 1. A consumable 9 protruding relatively far out of the housing opening 10 in the sample application position, reveals more easily to a user that a sample is now to be applied to the sample application surface 34. In particular, the test field 32, to which the sample is supplied by capillary forces, for example, may be situated so close to the sample application surface 34 that the required sample volume is minimal.

Please add the following paragraph after the paragraph on page 12, lines 22-30:

While the invention has been illustrated and described in detail in the foregoing drawings and description, the same is to be considered as illustrative and not restrictive in

character, it being understood that only illustrative embodiments thereof have been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.

Please delete the heading “List of references numbers on page 13.

Please delete the list of reference numbers of pages 13-14.